REMARKS

Applicant appreciates the thorough review of the present application as evidenced by the Official Action. In addition, Applicant appreciates the indication that claims 13-22, 35-44 and 57-66 would be allowable if rewritten in independent form. In light of the amendments to independent claims 1, 23 and 45 and the subsequent remarks, Applicant respectfully submits that the rejection of claims 1-12, 23-34 and 45-56 under 35 USC § 102(b) as being unpatentable over U.S. Patent No. 4,858,146 to Shebini is overcome and requests reconsideration and allowance of the present application.

A. The Rejection of Claims 1-12, 23-34, and 45-56 under 35 U.S.C. § 102(b) is Overcome

The Official Action rejected claims 1-12, 23-34, and 45-56 under 35 U.S.C. § 102(b) as being anticipated by the Shebini '146 patent. As described below, however, the methods, systems and computer program products for design analysis of a component of the claimed invention are not taught or suggested by the Shebini '146 patent.

The Shebini '146 patent discloses an automated design system in which finite element models of structures are stored in a database and are made available to various engineering disciplines so that each engineering discipline is utilizing the same finite element model of the structure. The system creates and analyzes the finite element model. A typical structural analysis usually consists of three distinct stages: Pre-processing; Analysis; and Post-Processing. (Col. 9, line 58 to Col. 10, line 19). The pre-processing stage includes modeling the structure, producing graphical displays of the model, and applying environmental loads, such as wave wind and gravity loads, to the model. The load components include node and element loads. Node loads consist of concentrated forces and moments, imposed displacements and rotations. Finite element loads include concentrated forces and moments, distributed edge forces or moments, surface pressures, temperatures, strain, and body-type loads, such as gravity and inertia. (Col. 10, line 39 to Col. 11, line 50 and Col. 17, lines 57-65). The analysis stage includes static condensation, non-linear interaction analysis and full-scale static analysis on the structure using

boundary conditions obtained from the non-linear interaction analysis to yield the internal node displacements and element forces and stresses of the structure. (Col. 10, lines 23-32 and Col. 11, line 49 to Col. 12, line 21). The post-processing stage includes applying some of the industry codes to check the integrity of the nodes and elements of the structure. If the checks are passed, the analysis cycle is complete, but if not, then the design of the structure is changed and the whole process is repeated. Graphics are used extensively during the post-processing phase, such that results are typically displayed in a variety of forms, such as deformed shapes and stress contours. (Col. 10, lines 32-37, Col. 12, lines 22-35 and Col. 32, lines 60-64). The Shebini '146 patent also discloses that the internal member forces that are determined during static analysis are employed to check the stress levels in the members. The stresses are compared to allowable stresses and the members are resized accordingly. (Col. 4, line 65 to Col. 5, line 25).

In contrast to the disclosure of the Shebini '146 patent, amended independent claims 1, 23 and 45 recite methods, systems and computer program products, respectively, for design analysis of a component that include prompting modification of the design of the component or a user-defined parameter and regenerating the finite element model if the stress response is outside of the preselected limits by **determining a part of the component that is likely to fail and a cause of the part failure and indicating at least one of a design of the component and at least one user-defined parameter to mitigate the cause of the failure**. As described in pages 25, line 24 to page 27, line17 of the specification, the detailed stress responses of the component are compared to pre-selected limits, as represented by the failure assessment block 46 of Figure 1. The exact causes of the component's unacceptable performance are then determined, such as by determining the cumulative damage index for each part of the component. Thus, the method, system and computer program product of the claimed invention are capable of determining the exact part(s) of the component that are likely to fail and are, therefore, causing the component to not meet the pre-selected limits. (See page 26, lines 1-15 and Figure 13). In addition, the method, system and computer program product of the claimed invention provide a detailed explanation of the reason for each part that fails and prompts the designer to modify the physical layout of the parts or the user-defined parameters in such a way as to mitigate the effect of the reason for the failure. (See page 26, lines 16-32).

While the Shebini '146 patent discloses a system that creates and analyzes a finite element model of a structure and applies some of the industry codes to check the integrity of the nodes and elements of the structure, such that the design of the structure may be changed if the checks are not passed and the whole process is repeated, it does not disclose prompting modification of the design or a user-defined parameter by determining a part of the component that is likely to fail and a cause of the part failure and indicating at least one of a design of the component and at least one user-defined parameter to mitigate the cause of the failure. The Shebini '146 patent states only that the design of the structure or members of the structure may be changed if the checks are not passed. As such, the Shebini '146 patent does not mention any type of determination of a part of the component that is likely to fail and the cause for the failure to prompt for modification of the design of the structure or a user-defined parameter to mitigate the cause of the failure as now recited by the claimed invention, such that a user of the Shebini '146 patent would necessarily have to separately determine what part of the component failed and what type of changes to the structure are needed to mitigate the cause of the failure without any help from the system of the Shebini '146 patent.

Thus, the system of the Shebini '146 patent is different from the method, system and computer program product of the claimed invention that automatically determines whether the stress response of the model is within pre-selected limits, and, if not, automatically prompts modification of the design or a user defined parameter to mitigate the cause of a failure of a part of the component, such that specific modifications are automatically proposed by the claimed invention. The Shebini '146 patent, therefore, does not teach or suggest design analysis of a component that includes prompting modification of the design of the component or a user-defined parameter by determining a part of the component that is likely to fail and a cause of the part failure and indicating at least one of a design of the component and at least one user-defined parameter to mitigate the cause of the failure, as recited by amended independent claims 1, 23 and 45.

Since the independent claims are patentably distinct from the cited reference, the claims that depend therefrom are also patentably distinct from the cited reference for at least the same reasons since the dependent claims include each of the elements of a respective independent

claim. Consequently, Applicant submits that, for at least those reasons set forth above, the rejection of the claims under 35 U.S.C. § 102(b) are overcome.

CONCLUSION

In view of the amendments and the remarks presented above, it is respectfully submitted that all of the present claims of the present application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicant's undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

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